**Description**

This battery module has been specially designed to be compliant with Germanisher Lloyd classification authority rules for the classification and construction of submersibles for the application in manned submersible ICTINEU 3, rated 1,200m. This ensures the highest standards of quality and safety in design, manufacturing and performance.

The result is a very compact pressure compensated battery module offering a very good weight and volume to power ratios, 148 VDC, 10.36 kWh in a 62 litre displacement box containing the BMS, the control circuit, the protective elements and the charge and main contactors.
## Advanced features and reliability

Ictineu battery system is very simple to install into an existing vehicle or platform, or into a new development, as our battery boxes have all the power, control and safety systems built-in, so we could say it is a pnp [plug and play] system. Obviously the system can be controlled and monitored externally having all the desired data (cells temperatures, SOC, SoH, cells voltages, current, etc.) but for simple applications, the battery module can be controlled just with two switches/signals, one for charge and one for discharge and the battery will be monitored and protected by the built-in systems.

The product has been designed with improved maintenance features including the ability to replace a single pack or any other internal component. The battery module compactness and conception makes it suitable for a high number of underwater applications, offering a very good weight and volume to power ratios, increasing the range and/or endurance of the vehicle.

The development has been done according to different standards (IEC, UL, UN) and GL rules and recommendations, compelling those specific for lithium-polymer batteries and those general to power systems. Intensive testing according to rules and standards has been applied to all elements of the system, including cells, BMS, safety elements and housing materials.

Accurate engineering and extensive review have been applied during the design of the architecture, cabling, connections and position of components, in order to ensure an efficient, compact and safe system.

### General Electrical Specifications

- **Voltage (nominal)**: 148 VDC
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- **Capacity**: 70Ah
- **Energy**: 10.36 kWh
- **Max discharge rated current**: 80 A (higher under request)
- **Peak current**: 120 A (3 seconds)
- **Discharge temperature**: -20 to 60 °C
- **Charge temperature**: 0 to 40 °C
- **Max charge current**: 30 A
- **Depth Rating**: 1200 m

### Batteries

- **Length**: 60 cm / 16.16 inch
- **Wide**: 27.5 cm / 10.7 inch
- **Height**: 44 cm / 17.16 inch
- **Displacement**: 62 liter

### Protection and systems

- **BMS**: Built-in
- **Control board**: Built-in
- **Charge management**: Built-in
- **Charge Power contactor**: Built-in
- **Main protection fuse**: Built-in
- **Main power contactors**: Built-in (2, 1 for each pole)

### Weight

- **Weight in air**: 114 kg
- **Weight in water**: 49.64 kg